DOCUMENT RESUME

ED 416 574 EA 028 894

AUTHOR	Miles, Karen Hawley; Darling-Hammond, Linda
TITLE	Rethinking the Allocation of Teaching Resources: Some Lessons from High Performing Schools.
INSTITUTION	Consortium for Policy Research in Education, Philadelphia, PA.
SPONS AGENCY	Office of Educational Research and Improvement (ED), Washington, DC.
REPORT NO	CPRE-RR-38
PUB DATE	1997-00-00
NOTE	56p.
CONTRACT	R308A60003
AVAILABLE FROM	CPRE, University of Pennsylvania, Graduate School of Education, 3440 Market Street, Suite 560, Philadelphia, PA 19104-3325, Attn: Publications ($12).
PUB TYPE	Reports - Research (143)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	Administrators; Budgeting; Case Studies; Change Strategies; *Educational Finance; Educational Objectives; Elementary Secondary Education; *Public Schools; *Resource Allocation; *School Administration; School Effectiveness; *School Funds

ABSTRACT

Although a great deal of debate surrounds the level and allocation of resources to public schools, very little of this discussion addresses how schools might organize teaching resources more effectively at the school level. This paper describes case studies of five high performing public schools that have organized professional resources in innovative ways. The study sought to detail alternative ways of deploying instructional resources in order to provide concrete alternatives to traditional organization of teachers and to quantify objectively the ways in which these schools use resources differently depending on their instructional goals and strategies. Although the schools studied looked very different from one another, they shared five principles of resource allocation which are outlined in this paper. The paper develops a framework for re-examining the use of resources and a methodology which may be used to measure the extent to which schools use their resources in focused ways to support teaching and learning. (Author)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 416 574

CPRE Research Report

Rethinking the Allocation of Teaching Resources: Some Lessons from High Performing Schools

Karen Hawley Miles
Linda Darling-Hammond

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

EA 028 094

CONSORTIUM FOR POLICY RESEARCH IN EDUCATION

PENN
GRADUATE SCHOOL OF EDUCATION

University of Pennsylvania
Harvard University
Stanford University
University of Michigan
University of Wisconsin-Madison

CONSORTIUM FOR POLICY RESEARCH IN EDUCATION

The Consortium for Policy Research in Education (CPRE) unites five of the nation's top research institutions in an exciting venture to improve student learning through research on education reform, policy and finance. The members of CPRE are the University of Pennsylvania, Harvard University, Stanford University, the University of Michigan, and the University of Wisconsin-Madison.

CPRE conducts research on issues such as:

- education reform
- student and teacher standards
- state and local policymaking
- education governance
- school finance
- teacher compensation
- student incentives

To learn more about CPRE, please call (215) 573-0700, and then press 0 for assistance.

In addition to conducting research as described above, CPRE publishes reports and briefs on a variety of education issues. The Consortium also sponsors regional policy workshops for state and local policymakers.

CPRE's home page can be found at: http://www.upenn.edu/gse/cpre/

CPRE Research Report Series

Research Reports are issued by CPRE to facilitate the exchange of ideas among policymakers and researchers who share an interest in education policy. The views expressed in the reports are those of individual authors, and are not necessarily shared by the U.S. Department of Education, CPRE, or its institutional partners. This publication was funded by the National Institute on Educational Governance, Finance, Policymaking and Management, Office of Educational Research and Improvement, U.S. Department of Education, grant number OERI-R308A60003.

Copies of this report are available for $12.00 each, pre-paid. Prices include book-rate postage and handling. Quantity discounts are available. Write:

CPRE
University of Pennsylvania
Graduate School of Education
3440 Market Street, Suite 560
Philadelphia, PA 19104-3325
Attention: Publications

Phone (215) 573-0700

Rethinking the Allocation of Teaching Resources: Some Lessons from High Performing Schools

Karen Hawley Miles
Linda Darling-Hammond

CPRE Research Report Series
RR-38

Consortium for Policy Research in Education
University of Pennsylvania
Graduate School of Education

© Copyright 1997 by the Consortium for Policy Research in Education

Contents

Biographies i

Acknowledgments i

Abstract ii

Introduction 1

Opportunities for Fundamental Reallocation of Resources 2

Study Methods and Analytic Framework 6

Study Findings 14

Barriers to Reallocating Resources 35

Developing the Knowledge and Capacity for New Teaching Roles 40

Conclusion 42

References 44

Appendix A 46

End Notes 48

Biographies

Karen Hawley Miles is a nationally recognized and published student of strategic planning in public schools and of district and school resource allocation. Her focus is how to rethink the use of resources to improve instruction. She has spent the last seven years working with school districts to rethink the use of resources and the organization of schools. She has worked to design school change and planning process in several urban districts. She currently works with New American Schools Corporation in an effort to create and implement "break the mold" designs for public schools. She co-directed the recent study by Economic Policy Institute, Where Has the Money Gone?, an analysis of the components of school spending over time. Prior to this she worked at Bain and Company as a Strategy and Management consultant for hospitals and corporations. She has a B.A. in Economics from Yale University and a Doctorate in Education for Harvard University, specializing in school organization, change and finance.

Linda Darling-Hammond is currently William F. Russell Professor in the Foundations of Education at Teachers College, Columbia University where she is also Co-Director of the National Center for Restructuring Education, Schools, and Teaching (NCREST) and Executive Director of the National Commission on Teaching and America's Future. She is actively engaged in research, teaching, and policy work on issues of school restructuring, teacher education reform, and the enhancement of educational equity.

Acknowledgments

We thank the staff at the five schools we studied for sharing with us their successes and frustrations. Special thanks to Patrick McNeeley, principal at Quebec Heights Elementary School in Cincinnati; Mary Nash at the Mary Lyons School in Boston; Myra Whitney, principal of Douglass Elementary School in Memphis; Paul Schwarz at Central Park East Secondary School; and Eric Nadelstern and Ruthellen Weiner at International High School.

We also thank Lori Chajet and Peter Robinson who helped collect much of the secondary school data as part of their research with the National Center for Restructuring Education, Schools, and Teaching.

Finally, this paper received support from the Consortium for Policy Research in Education (CPRE), Grant No. OERI-R308A60003 from the National Institute on Educational Governance, Finance, Policymaking and Management, Office of Educational Research and Improvement, U.S. Department of Education.

Abstract

Although a great deal of debate surrounds the level and allocation of resources to public schools, very little of this discussion addresses how schools might organize teaching resources more effectively at the school level. This paper describes case studies of five high performing public schools that have organized professional resources in innovative ways. The study sought to detail alternative ways of deploying instructional resources in order to provide concrete alternatives to traditional organization of teachers and to quantify objectively the ways in which these schools use resources differently depending on their instructional goals and strategies. Although the schools studied looked very different from one another, they shared five principles of resource allocation which are outlined in this paper. The paper develops a framework for re-examining the use of resources and a methodology which may be used to measure the extent to which schools use their resources in focused ways to support teaching and learning.

Introduction

While school reform proposals vary in their details, all call for dramatically improving student achievement. Plans to accomplish that goal typically include implementing a high standards curriculum program, instructional strategies that create more time for individual attention for students, and increasing time for school wide teacher planning and learning. In an era of belt-tightening and rising student enrollment, finding the resources to do this will require schools to reexamine the use of every dollar. Much publicity has surrounded efforts to redirect dollars from administrative or operational functions back into the classrooms. At the same time, little attention has been given to rethinking the use of existing instructional resources—instructors, support professionals and technology—schools' most important and expensive resources.

Reform after reform initiative has faded away with little effect on the basic organization of schools. The typical school has approximately one teacher for every 18 students and one adult for every nine students (NCES, 1994). Despite the apparent potential for individual attention and planning time for teachers, class sizes are well over 25 for most students most of time, teacher student loads exceed 120 in most secondary schools and teacher planning time is fragmented and uncoordinated. As Seymour Sarason (1982) has written:

> *The fact is that one of the major factors maximizing the gulf between educational goals and accomplishments has been the way resources have been defined...There is a universe of alternatives one can consider and if we do not confront that universe, it is largely because we are committed to a way of defining who should be in the classroom...One teacher to one classroom is not an end in itself, but one means of providing more time for individual students when needed* (pp. 275, 284).

The Consortium for Policy Research in Education and the National Center for Restructuring Education, Schools, and Teaching hope to contribute to this discussion of alternative ways of organizing instructional resources by describing in detail how a few schools have broken with tradition and improved student achievement significantly. Case studies of five schools illustrate possibilities and highlight the conditions which appear to facilitate or limit this kind of resource restructuring.

This paper has five sections. The first section outlines a framework for thinking about opportunities to re-examine the use of resources. Section two describes the methodology used to select and analyze innovative schools. Section three summarizes the findings by describing each sample school in detail, then comparing them to each other and to traditional schools. The final two sections summarize the barriers that exist to reorganizing resources and the ways teachers say they are learning to teach more effectively in new school designs.

Opportunities for Fundamental Reallocation of Resources

Finding resources to create more individual time for students and increase professional time for teachers without prohibitively raising costs demands rethinking the existing organization of resources. This paper focuses on the use and assignment of teaching staff, one of the most under-explored and complex areas of potential resource reallocation. Researchers and observers have commented on the striking similarity, across districts and over time, in the organization of schools and distribution of resources, despite increases in funding and changes in school expectations.

Nationally, the number of pupils per teacher dropped from 26 in 1960 to 17.6 in 1992 (NCES, 1994). On the surface, it would seem that this investment could have created schools which provide a very different level of individual attention to students and perhaps more time for teachers than was possible in the public schools attended by most of today's parents. But, for most students and teachers, very little has changed. Because most of the teaching resources have been added outside the regular classroom, the average count of 18 students for every teacher is far from the daily reality most educators and students face. Class size ranges between 24 and 28 for most students; teachers see more than 120 students daily in most secondary schools; and teacher planning time is sparse, fragmented, and uncoordinated.

A recent analysis of staffing and spending patterns from 1967 to 1991 in nine different districts across the country shows that only a small portion of new teaching staff went to reduce class sizes for regular education students. Virtually all of the increase in staff per pupil went to provide small classes to the growing number of students in special programs, and to improve teacher working conditions by adding a modest amount of time to free teachers from instruction during the school day (Miles, 1997a and 1997b; Rothstein and Miles, 1995).

Even as schools have added instructional staff to provide new services, staff new programs, and create planning time for teachers, the portion of resources devoted to classroom teaching has declined. Since 1950, the proportion of school staff who are classified as teachers has dropped from 70 percent to 53 percent, of whom only about three-fourths are regularly engaged in classroom teaching (National Commission on Teaching and America's Future, 1996). The number of both non-teaching professional staff and non-teaching support staff has grown substantially. By contrast, 60 to 80 percent of education staff in most European countries are classroom teachers, allowing for much greater flexibility in the use of teacher time, including much greater time for collaborative planning and professional development (OECD, 1995).

Analysis of the allocation of teaching resources in the Boston Public Schools identifies six educational and management practices that explain the difference between the apparently rich potential and reality in U.S. schools (Miles, 1995). These practices include:

- separate, specialized programs for small subsets of students and teachers;
- instruction-free time for teachers spread throughout the student day;

- formula driven student assignment;
- fragmented high school schedules and curriculum;
- large high schools; and
- inflexible teacher work day and job definition.

While the relative impact of these practices on the use of teaching resources differs to some extent in each district, the practices are strikingly consistent across districts and over time. These practices are so widespread that Tyack (1994) describes them as the "grammar of schooling." Sarason (1982) dubbed this constancy in school organization "school regularities." This set of six practices forms the basis of our conceptual framework for understanding and quantifying the use of teaching resources in both traditional and untraditional schools. A brief description of each practice and their relative impact on the use of teaching resources provides the foundation for much of the remaining discussion.

Specialized Programs. In most school districts, a significant portion of teachers work outside the regular classroom with special populations of students in separate programs such as special education, Title 1 compensatory education, bilingual education, remedial education or gifted education. This number has increased significantly in recent years. The Economic Policy Institute found that programs for special student populations have absorbed 58 percent of the new dollars devoted to education from 1967 to 1991 (Rothstein and Miles, 1995). Many of these programs operate under federal, state, district, and sometimes collective bargaining regulations that restrict the ways in which teachers may be used and students may be grouped. Most districts operate these programs generally using a pull-out model in which students leave the regular classroom for all or part of the day for remedial instruction in small groups. In Boston in 1991, teachers in specialized programs working outside the regular classroom represented over 40 percent of the teaching force.[1]

Instruction-Free Time for Teachers. Currently, most school districts provide teachers with short periods of time free from instruction by using other classroom teachers to give instruction at these times. At the elementary level, teachers typically have a 45-minute duty-free period four or five times a week which is typically covered by specialists in art, music or physical education. In 1991, this represented nine percent of Boston's elementary teaching resources. At the secondary level, a teacher might teach five of seven instructional periods. Other teachers cover instruction during the 30 percent of the student's instructional day when the teacher is not teaching. Generally, teachers spend one of these periods planning and the other covering non-instructional duties, ranging from hall or cafeteria duty to coordination of in-school programs. Although secondary teachers have more preparation time than elementary teachers (about five hours per week as opposed to three), the short, fragmented blocks of non-instructional time do not allow substantive planning and collaboration. These activities require longer blocks of uninterrupted time that is coordinated with other teachers.

Formula Driven Student Assignment. Following the factory model of efficiency and standardization, the process of

American schooling has been broken into small, specialized pieces through which students are expected to move at an even rate. Under this model, districts use formulas to assign students to classrooms in a regularized fashion by pupil age, subject and program. Much has been written regarding the educational shortcomings of this factory-like model (Darling-Hammond, 1996, 1997). Furthermore, these formulas are costly due to the uneven allocation of teachers over grades, small programs and undersubscribed subjects which contribute to unplanned differences in class size unrelated to educational strategies.

Using formulas to allocate students to classrooms by age can create huge variation in elementary class sizes. For example, the elementary class sizes of the Boston Public Schools are capped at 28 students. When the 29th student enrolls in a school with only one class in that grade, a new teacher must be added, and the average class size falls dramatically from 28 to 14.5. In 1991, regular elementary class sizes in Boston's 645 elementary classes varied from 15 to 31. Class size differences of 8 or 9 students from one grade to another in the same school were not unusual. The more separate programs and subjects a school has, and the more constrained it is by age grading or tracking practices, the more often this kind of unplanned variation in allocation of resources occurs.

Fragmented High School Schedules and Curriculum. Curriculum and scheduling traditions limit time available for individual attention and teacher planning. The problems of age grading are compounded by tracking, program schedules, and teacher and subject specialization. Perhaps the most unfortunate effect of this fragmented approach to schooling is its impact on student loads. In 1991, the majority of Boston's middle and high schools scheduled students for seven 45-minute periods a day. Each teacher worked with 125 to 150 students per day, with five classes of 25 students in middle school and classes of 30 in high school. Reducing teaching loads without dramatically increasing costs demands rethinking curriculum and scheduling to lengthen the duration of classes with each teacher. That is, instead of seven 45-minute courses per day, students and teachers might have four classes a day, each lasting over an hour. This can be accomplished either by combining traditionally separate subjects, or by segmenting the school year into learning institutes and allowing smaller groups of students to work intensively with teachers in fewer subjects, much as is done in colleges and universities (Carroll, 1994).

Large High Schools. The average enrollment of secondary schools nationally is nearly twice that of elementary schools (NCES, 1994, Table 95). Schools get larger as students progress through the system. Boston high schools average more than 1,000 students, nearly three times the size of the city's elementary schools and twice that of the average middle school. Comprehensive high schools in New York City average over 2,000 students, and some are well over 3,000 students. The conventional justification for this size difference is that larger enrollments create economies of scale by distributing administrative and operating costs and offering a more diverse curriculum cost-effectively. However, existing research suggests that high schools have created more internal specialization and departmentalization than can be scientifically justified (Lee, Bryk and Smith, 1993).

Studies have found that larger schools do not increase average achievement but they do lead to increased alienation and detachment among students and teachers, higher dropout rates, and larger numbers of administrative staff, thereby deflecting resources from classroom instruction. Furthermore, beyond about 400 students, gains in achievement that could be attributed to curriculum diversity disappear increasingly and become declines in achievement due to excessive tracking and depersonalization (For reviews, see Lee, Bryk and Smith, 1993; Darling-Hammond, 1997). These findings suggest that schools need to find ways of creating more personal learning environments without adding significantly to administrative costs or substantially reducing students' access to critical programmatic offerings.

Inflexible Teacher Work Day and Job Definition. In Boston, the union contract specifies the required hours of work, from starting time in the morning to ending time in the afternoon. This contract provision makes it difficult to stagger starting times to make the best use of staff time or to meet student needs. For example, one high school wanted to change the work hours of its guidance staff so they would start later in the day and end the day after 4:30 to enable students to meet with guidance counselors when it did not conflict with their coursework. However, the contract forbids such changes in work hours and the request was disallowed. The contract also stipulates the way teachers can be assigned over the day, requiring that planning time be spread over the day and forbidding a teacher to teach more than three periods in a row. This makes it difficult to combine instruction-free periods for teachers to create longer blocks of time.

The use of part-time teachers is explicitly forbidden if they substitute for potential full-time positions. Choosing two part-time teachers costs less than one full-time teacher because part-time teachers do not earn benefits. While the regulation intends to discourage management from substituting lower-cost and potentially lower-quality teachers for dedicated full-timers, it limits the most effective use of resources. One way to create common planning time for groups of teachers during the school day is to schedule coverage by specialist teachers by hiring a larger number of part-time teachers. Limiting part-time staff makes this strategy more difficult. Also, rigid definitions of the work-day and work hours exclude from the teaching force potentially talented individuals who cannot or choose not to work during typical school hours.

In summary, this analysis of traditional allocation of teaching resources highlights six practices that offer opportunities for realigning teaching resources to provide more individualized attention and more effective time for teacher planning (Miles, 1995). Changing any one of these practices may not free enough resources to significantly alter group sizes or planning time. Many current patterns of teacher allocation have evolved as incremental responses to teaching conditions and traditions, so it follows that small adjustments may not break this cycle. For example, without changing the seven to eight period schedule for secondary schools, it is difficult to conceive of a humane schedule that consolidates teacher planning time in one spot during the day. Similarly, eliminating one category of pull-out programs is unlikely to allow significant reductions in class size. It is only by considering these practices together that the

full range of alternatives becomes possible. These opportunities include:

- *Reduction of specialized programs and creation of more generalized roles for teachers.* Schools rethinking resources could consider how remedial, special education, Title 1 and bilingual education resources might work together to support an integrated plan to benefit these students in the regular education setting.

- *More flexible student grouping targeted to individual student needs.* Traditional schools assign teachers and students to classrooms using formulas and classifications of students such as age, program (special education, bilingual, Title 1) and ability. Group sizes stay constant over the day regardless of lesson and skill level. Schools looking for better ways of matching resources and student needs could consider new ways of assigning students to groups based on educational strategies.

- *Structures that enable personal relationships.* The traditional large secondary school with its fragmented schedules and heavy student loads makes it difficult for students and teachers to know one another. To address these issues, schools could consider ways of restructuring schedules and grouping to reduce teacher loads and create smaller contained teacher-student groups.

- *Longer and more varied blocks of instructional time.* Traditional schools have created inflexible, fragmented daily schedules. Schools could consider ways of more effectively matching resources to teaching and student needs for better ways of matching the daily schedule to learning requirements.

- *Creation of more usable common planning and professional development time for teachers.* Traditional schools have not designed non-instructional time to enable significant joint curriculum or professional development. Schools rethinking their use of teaching resources could consider ways of creating longer periods of time for teachers to plan and develop curriculum together.

- *Creative definition of staffing roles and work day.* Traditional schools use full-time teaching staff all working the same hours. While some schools use instructional aides to support teachers, most schools do not have systematic strategies for using aides or other non-certified teachers to support instruction. Schools looking to match resources to student and staff needs could consider the use of part-time positions and varied job schedules.

Recent surveys suggest that public schools engaging in a comprehensive reallocation of resources are quite rare (Rettig and Canady, 1993).

Study Methods and Analytic Framework

Because alternative models of organizing schools are so rare, we sought to identify and describe in detail five schools which used teaching resources very differently to generate high student achievement. This section outlines the methods used to select the five case study sites, the data collection process and the analytic framework.

BEST COPY AVAILABLE

Sample Schools

To create a sample of schools that could offer insight into the possibilities and challenges involved in rethinking the allocation of instructional resources in public schools, we sought a balance of elementary and secondary schools each of which:

- Has engaged in a significant rethinking of resources touching on at least four of the resource principles listed above.
- Uses no significant extra resources beyond the school district's average per pupil, except start-up or training grants.
- Serves a diverse student population in terms of income, ability and percent of bilingual and special needs students.
- Has used a new organization model for at least two years.
- Has strong evidence that the changes have improved student performance.

Experts involved in national reform networks were surveyed to identify such schools. The five schools selected represent different educational strategies and organizations. Three of the schools are model schools started from scratch, which had considerable flexibility in hiring their staff and designing their programs. The other two schools restructured existing programs and staff. The sample includes the three elementary schools and two secondary schools described below.

Quebec Heights Elementary School in Cincinnati, Ohio had, at the time of the study, 500 students in grades K-6, with 15 percent classified as having special education needs and 70 percent eligible for Title 1. Quebec Heights eliminated age and program-based instructional grouping and assigned students to smaller, multi-aged, heterogeneous groups that remain together for three years. The school created reading groups of eight or fewer students. Teachers have common planning time each day and teachers pursue professional development in the school's priority areas during the school day. Cohort analysis of student performance data shows that special education and regular education students have improved faster than the Cincinnati average.

Douglass Elementary School in Memphis, Tennessee had 475 students with 17 percent classified as special education and 88 percent qualifying for Title 1 support. At the time of the study, the school was in its third year of implementing the "Success for All" program which restructured school resources to allow 90 minutes a day of reading and daily individual tutoring for first and second graders not meeting grade-level standards. The Douglass school was working to integrate its special education students and teachers fully into the regular classroom. After the second year of implementing the program, the percent of second graders (the only students with two years of the new model) scoring at or above the median in language arts increased from 17 percent to 59 percent. In addition, the school's evaluation of special education integration showed these students continuing to progress academically and socially.

Mary C. Lyons Model Elementary School in Boston, Massachusetts had 90 students in grades K-5: sixty of whom were classified as regular education and 30 had severe emotional disturbances previously requiring

placement in highly restrictive settings. Over 80 percent of students qualified for Title 1. The Mary Lyons School fully integrated all special education students to create class sizes of 15 or fewer students for all classes, each having a teacher and instructional assistant. Lyons redefined the school day to extend school hours from 7:00 a.m. to 5:15 p.m. Lyons School is the only elementary school studied that used outside contractors to provide instruction, and used a variety of staffing arrangements, including paraprofessionals, teacher interns, part-time workers, and staggered shifts. The school was one of 15 (out of 115) Boston schools to be over-subscribed by every race for special education and regular education slots three years in a row. Standardized achievement test scores showed that both special education and regular education students improved faster than the Boston average and that 100 percent of the students were reading on grade level.

Central Park East Secondary School in New York, New York served 450 students in grades 7 through 12, approximately 25 percent of whom qualified for special education and 60 percent for free or reduced price lunch. All students are integrated in heterogeneous classrooms. The school restructured the typical daily secondary schedule to create two-hour blocks of instructional time for the humanities and math/science. Teachers had more than seven hours each week of common planning time in addition to their daily individual preparation periods. To reduce academic group sizes, Central Park East allocates nearly all its positions for teaching, rather than hiring guidance counselors and other administrative staff. All professional staff members lead 10 to 12 student advisory groups that meet three hours a week. The school hires some part-time teachers on a consulting basis for elective courses such as foreign language instruction. Central Park East has been nationally heralded for its consistently exceptional graduation and college admission rates relative to the rest of New York City schools. Each year since its inception in 1985, more than 90 percent of Central Park East students have graduated and more than 90 percent have been accepted to college.

International High in New York, New York is an alternative school serving 475 recent immigrant students in grades 9 through 12. Only students who have been in the United States fewer than four years and who score below the 20th percentile on an English language proficiency exam are admitted. At the time of the study, over 75 percent of the students were eligible for free or reduced price lunch. International offers a high school curriculum that integrates all state-mandated subject matter in an interdisciplinary curriculum taught in multi-aged heterogeneous groups. Teachers work with no more than 75 students a term and spend 70 or more minutes with them each day. The teachers have nearly six hours each week of common planning and professional development time. All staff members lead a small advisory group that meets weekly to discuss issues of personal, academic, and social growth. Despite its high risk population, the school's dropout rate was less than 1 percent in 1993-94 as compared to the citywide rate of 30 percent. In 1993, both the graduation rate and college acceptance rates exceeded 95 percent. These rates have exceeded 90 percent annually for more than a decade. International High has won numerous national and local awards honoring its

achievements (IHS, 1995; Darling-Hammond, Ancess, and Falk, 1995).

Table 1 summarizes the resource allocation strategies used by the five sample schools. Each school implemented multiple strategies for allocating teachers and teaching time to better match student needs and create more planning time. Only the three new model schools having alternative status—Lyons, Central Park East and International—created differentiated teaching roles by contracting with other providers for teaching or by restructuring some teaching positions. The high schools reallocated non-teaching professional positions in order to have more classroom teachers.

Data Collection

To understand the resource allocation practices of each of the five schools, we collected information about school expenditures, staffing and student scheduling. District level budget and staffing information allowed comparisons of the sample schools with more traditional schools. This analysis focused on resources providing the school's academic program and support services. The costs of operating a school include: provision and support of the academic program; administration and support services; provision and maintenance of the physical plant; and auxiliary services such as food, transportation, and security. Comparison of physical plant and auxiliary service costs across the sample school districts was not feasible within the scope of this work.

Table 1
Resource Reallocation Strategies Used by Sample Sites

Strategy	Lyons	Quebec	Douglass	Inter-national	CPESS
Reduction of Specialized Programs	•	•	•	•	
More flexible student grouping	•	•	•	•	•
Structures to create more personal environments	•	•	•	•	•
Longer and varied blocks of instructional time	•	•	•	•	•
More common planning time	•	•	•	•	•
Creative definition of staffing roles and work day	•			•	•

• = Sample school implements strategy

Researchers conducted interviews with administrators and teachers and examined written materials available at each school to understand how the school had reorganized and how this reorganization was linked to educational purposes. Where possible, researchers observed staff or team meetings and classes.

Although not a focus of this paper, researchers also conducted interviews exploring the challenges and benefits of the schools' efforts to reorganize. These interviews detailed contractual, regulatory or policy barriers or supports to changing the allocation of resources. Interviewers also asked teachers to highlight the changes that posed the most significant learning challenges and the professional development vehicles they found most useful in helping them acquire new knowledge and skills.

Analytic Framework

Each of the schools used different strategies to implement the common principles of resource allocation. This study created measures to allow comparison of resource allocation patterns between the models studied and traditional schools. This required two steps: developing useful measures; and creating meaningful traditional school comparisons.

The measures were developed by hypothesizing the quantifiable impact each resource allocation principle might have on resources, then testing this impact by several indices. The indices aim to be descriptive of what is happening in both traditional and nontraditional schools, easy to understand, and replicable.

Choosing measures that accurately portray what is happening in the more fluidly organized sample schools yet still allow comparison to traditional schools creates a tension between finding easily understood, easily calculated measures and developing measures which provide meaningful description. The subtleties can be seen in the attempt to measure the impact of the principle, "reduction of specialized programs to create more individual time for all." In a traditional school, regular class size is a useful gauge of how much access a student might have to individual attention from the teacher. But, regular class size does not reflect the regular-education student's experience in some innovative schools because it does not describe the way these schools organize by subject and over the course of the day. For example, the regular class sizes of 24 at Quebec Heights school distorts student experience because all students spend 90 minutes a day in groups of eight for reading. In order to capture this additional individual time for all students, a measure of *average instructional group size*, is used instead of regular class size. This measure demands greater descriptive knowledge of a school, but it reflects student experience more accurately.

Table 2 summarizes the measures used for each resource allocation principle. Application of the *first principle, reduction of specialized programs to create more individual time for all in heterogeneous instructional groups,* should lead to smaller average size of instructional groups for all regular education students and to more even distribution of resources between regular and special program students. Three measures were used to assess the differences between innovative schools and traditional schools.

Students per teacher. This number includes all teachers and students from all programs in the school. At the school level, our sample schools had roughly similar numbers of students per teacher. However, a school can reduce its functional student to teacher ratio by converting typical non-teaching slots to teaching roles. For example, Central Park East School has converted its guidance counselor, assistant principal, and librarian positions to teachers, providing smaller ratios of students to teachers than a traditional school with the same student population. The index of students per teacher indicates only the opportunity to create small, flexible instructional groups. It does not reflect the actual size of the groups in which most students spend time.

Weight average group size. This measure calculates the weight average size of the instructional group which a regular education student experiences over the day for academic subjects. It incorporates the time spent in different group sizes over the day for typical students. For example, if students in a classroom of 24 spent 90 minutes a day (25 percent of their school day not including lunch) in reading groups of eight, then the weight average group size would be 20 (.75 times 24 plus .25 times 8). In a traditional school, the average group size and the regular class size would be the same. This measure may offer a clearer sense of how much access to individual attention most students have.

Percent of teachers in regular education instructional groups. This figure divides the number of teachers who work with regular education students (including classroom teachers, subject specialists and other teachers who work all day instructing groups that include regular education students) by the total number of teachers in the school. The figure gives a sense of how much a school has concentrated its resources on core classroom functions as opposed to special or pullout programs.

The second principle, more flexible student grouping by school professionals, should allow educators to create instructional groupings that more closely match instructional needs. As described above, strict formulas that mandate the size of groups and classrooms can create situations where the size of groups varies for no educational reason. When teachers can create their own groups using criteria linked to educational strategies, they can reduce these unplanned variations and create a strategy that maximizes the use of limited resources. The two measures of this principle include:

- **Percent of regular education students in targeted group sizes** represents the extent to which a school has minimized random variation in class size. In traditional schools, where no group size target existed other than the contractually defined class size maximums, we measured how many students were in classes which were within five percent of the average size. More flexible student grouping also allows teachers to create smaller groups for target subject areas.

- **Average size of instructional groups in focus area** measures how schools focused resources to create more individualized attention in some subjects. If some regular education students spent time in much smaller instructional groups, this would be reflected in the average by calculating

the percent of students receiving such support.

Four aspects of the *third principle, structures to support more personal relationships between teachers and students,* lend themselves to measurement.

Student load is a primary indicator of an academic teacher's opportunity to invest time in building relationships with each student.

Percent of professionals who serve as instructors or advisors to regularly scheduled groups of students in an ongoing fashion is an indicator of a school's effort to maximize personal relationships. An assistant principal who worked with occasional discipline problems or a guidance counselor meeting once with each of 200 students to ensure compliance with graduation requirements would not be included. Although these singular contacts with students can be important, they do not aim to build long term, personal relationships between school professionals and students.

Average size of teacher and student teams or clusters provides a third measure of the opportunity to create a more personal educational environment. For this measure, student-teacher teams had to be self-managing and self-contained. This means that virtually all instruction occurs within the cluster and that the cluster has primary responsibility for curriculum, grouping, discipline, and evaluation of its students.

Number of years teachers and students stay together measures a strategy schools use to create personal relationships by keeping teachers and students together for longer than the typical year.

The extent to which sample schools created *longer and more varied blocks of instructional time, the fourth principle,* is measured by the average scheduled ***length of instructional period*** for academic subjects in secondary schools. In some of the schools studied, teachers regularly vary the length of instruction from the schedule to suit the particular lesson. These variations were not calculated.

Finally, two measures are used to understand how different our sample schools were in applying the *fifth principle of creating more useful common planning time for teachers.*

Number of minutes of common planning time is defined as time which is shared with other teachers who are part of the same instructional team.

Length of the longest planning period is a second important indicator of the usefulness of the planning time. For some kinds of planning and development, teachers need time periods longer than the typical 40 to 50 minutes.

We compare each innovative school with a typical school in the same district serving a similar student population. Meaningful comparisons must include an adjustment for the mix of students eligible for special services because schools typically receive additional resources to serve these students. Adjusted for student mix, the sample schools used the same or fewer resources on an ongoing basis than traditional schools. In two cases, no traditional school in the district served the same mix of students as our sample sites. The Lyons elementary school in Boston draws a large percentage of its population from special education students typically served by private schools.

BEST COPY AVAILABLE

Table 2
Measuring Resource Allocation Patterns
Staff Allocation

Resource Allocation Principles	Expected Impact on Resources	School Measure
Reduction of specialized programs to create more individual time for all	• Smaller sized regular education instructional groups • More even distribution of resources between regular and special program students	• Students per teacher • Average size of regular ed instructional groups • % teachers in reg instructional groups
More flexible student grouping by school professionals	• Smaller instructional groups in focus areas • Less unplanned variation in class sizes	• % students in target regular ed size groups • Average size of group in focus area
Structures to support more personal relationships	• Lower teacher student loads • More adults involved in instruction • Smaller teams of teachers and students • Multi-year relationships between students and teachers	• Teacher student loads per day • % adults instructors/ advisors • Size of teacher/student clusters • Length of student/ teacher relationship
Longer and more varied blocks of instructional time	• Longer instructional periods for academic subjects	• Average length of instructional period for academic subjects
More common planning time	• More minutes of common planning • Longer periods of time for planning	• Common planning minutes/week • Length of longest planning period
Creative definition of staffing roles and work day	• Use of part-time or contract staff • Use of interns or paraprofessionals for instruction • Staggered work schedules	• Not applicable

A hypothetical comparison was created for Lyons based on the assumption that these students were served in separate, self-contained classrooms of four students each, the smallest existing class size. Social services and other support staff were assumed to be the same level as the Lyons School.

The International School in New York City serves a unique population of limited-English-proficiency students who speak more than 40 different languages. Traditional schools serve such students through many distinct bilingual programs and ESL courses that are offered separately from the rest of the high school curriculum, but traditional schools do not require such services for 100 percent of their student population. To create a comparison to the International School, we used the New York City Board of Education staffing formula to determine the number of teachers the school would have been allocated and assumed the additional resources that would have been used outside the regular program to provide remedial support to students through bilingual programs and ESL courses. This generous assumption about universal ESL services to limited-English-proficient students does not hold true in any of New York's traditional schools, but it does offer a best-case scenario for allocating resources in a traditional model.

These calculations are intended to provoke discussion and to provide an objective way of comparing innovative and traditional schools. Obviously, other factors contribute to the opportunity for individual attention and the creation of teacher planning time which these measures do not incorporate. For example, a teacher in a class of 24 students may use sophisticated grouping practices that allow her to provide some individual or small-group instruction to students throughout the day. Such variations in grouping strategies are not incorporated into this measurement scheme unless the entire school uses the strategy. The existence of planning and development time does not guarantee that it is used to improve teaching quality. Further, teachers in many schools voluntarily find common planning time outside the school day. These measures are intended to be used in conjunction with a descriptive understanding of the way a school has organized to match teaching resources to student needs and to provide opportunity for teacher growth.

Study Findings

The findings for elementary and secondary schools are discussed separately in this section because they have such different organizational structures. With their relatively small teaching loads and self-contained multi-subject classrooms, elementary schools allow more flexible, individual instruction than secondary schools. But their simple structures, providing limited teacher time free from instruction, do not offer the same opportunities for freeing time and resources as secondary schools. Because of the elementary school's simpler daily schedules, reducing the use of pull-out programs for special education, language arts and Title 1 instruction is a primary lever for creating smaller groups for all. In contrast, traditional secondary schools, with their fragmented daily schedules, large teaching loads, and larger amounts of non-teaching time offer more ways to reconfigure resources.

21 BEST COPY AVAILABLE

Elementary Schools

Table 3 presents the resource allocation measures for the three high-performing sample elementary schools. In the three urban districts studied, the traditional schools served regular education students in age-graded, self-contained classrooms. About 75 percent of the teachers worked with regular education students, the other 25 percent worked with Title 1 and special education students outside the regular classroom. Because all of these schools are in urban areas, with high concentrations of students living in poverty, even the traditional schools were using at least some of their Title 1 teachers as regular classroom teachers. Thus, their regular education class sizes averaged between 19 and 22. Class composition and class size stayed the same all day, for all subjects, except when students were pulled out for special education or Title 1 instruction. The elementary classroom teacher instructed all subjects except specialties like art, music, and gym which were taught by specialists during the classroom teacher's free period. Teachers had 45 minutes three to five times a week free from instruction plus short lunch periods. These instruction-free times were not coordinated with other teachers in any systematic way.

Reduction of Specialized Programs

In departing from the traditional organization, the sample schools increased the percentage of teachers who worked with all students regardless of program. As Table 3 shows, the percent of teachers working with heterogeneous groups of students in the regular education program ranged from 28 to 77 percent in the traditional comparison schools and from 91 to 100 percent in the restructured schools. Those teaching special education students in substantially separate classrooms at Quebec Heights were the only teachers not working with heterogeneous groups of students.

Each elementary school used different levers for realigning instructional resources to better match student needs. The specifics of each school's strategy depended upon its each educational goals and purposes. Quebec Heights used multi-age grouping to design a school structure which responded more effectively to the diversity in student skill levels. Table 4 shows how the Quebec Heights strategy reduced specialization in three ways. First, they assigned students to multi-age clusters, called "families," each containing three or four teachers and 75 to 85 students. The families span three grades—either primary (grades 1-3) or intermediate (grades 4-6)—and remain together for three years. Each student has a homeroom teacher who has primary responsibility for an average class of 22 students for the full year, but students may work with any instructor within the family during the day. Instead of varying the curriculum by age level, all students in the family study the same basic curriculum during the year, but at their own developmental levels. Under this approach, some first graders may study topics traditionally included in the third grade curriculum. To allow this more flexible approach to content coverage, the Cincinnati school district developed promotion standards for the end of grades three and six, as well as yearly promotion standards for the critical skill levels students are expected to attain each year.

Table 3
High Performing vs. Traditional Elementary Schools

Resource Allocation Principles	School Measure	Quebec Heights		Douglass		Lyons	
		Avg.	Trad.	Avg.	Trad.	Avg.	Trad.
Reduction of specialized programs	Students per teacher	15	15	16	16	11	7
	Average size of regular ed instructional group	19	21	26	22	13	19
	% of teachers in regular ed instructional groups	91	77	95	76	100	28
More flexible student grouping by school professionals	% students in target size instructional groupings	100	65	100	60	NA	NA
	Average size of instructional group in reading	7	21	20	22	6	19
Structures to support more personal relationships	Student loads for primary classroom teachers	22	21	24	19	13	19
	Length of time students stay with teacher	3 years	1 year	1 year	1 year	1 year	1 year
More common planning time for teachers	Common planning minutes/week	325	100	135	0	405	45
	Length of longest planning period	45	45	45	45	105	45

Table 4
Quebec Heights Elementary School

Resource Allocation Principles	Model Components	Changes in Teacher Allocation
Reduction of specialized programs	• Multi-age, heterogeneous groups for all subjects	• No grade level teachers • Title 1 instructors used schoolwide, concentrate in grades K-3 • Special Ed resource teacher works with all students in primary team
More flexible student grouping by school professionals	• Daily regrouping of students based on lesson, skills • 90 minutes per day of reading instruction in groups of 8 or smaller	• Title 1 instructors rotate to reduce the size of all groups for reading
Structures to support relationships	• Multi-age clusters of students in grades K-3 and 4-6 remain together for 3 years	
More common planning time for teachers	• Teachers have 50 minutes daily common planning time with their cluster • Whole school has 20 minutes common time daily	• 5 specialists cover instruction • Average regular group size rises to provide specialists • Elementary school day 20 minutes shorter than secondary school to add planning time
Creative definition of staffing roles and work day	• Trained instructional assistants provide reading instruction in small groups throughout the day	• Instructional assistants do not play general role in all classes but rotate to create small reading groups in grades 1-3

A second way that Quebec Heights reduced specialization was eliminating separate Title 1 programs and using these resources to reduce the size of reading groups for all students. The third way of reducing specialization was fully integrating special education students and resource teachers into the families. In the primary grades, the special education resource teacher works as one of four teachers in a team responsible for a group of 85 regular and special education students.

The Douglass Elementary School in Memphis used its Title 1 budget as the primary lever for rethinking resources to improve student performance (Table 5). Because 97 percent of its students qualify for Title 1 assistance, Douglass has long been free to use Title 1 dollars across the school. This approximately $250,000 dollars per year represents nearly 20 percent of the school budget. Unlike any other school in this sample, Douglass restructured resources using an existing model for improving student performance, the Success for All program. Following this model, Douglass uses Title 1 funds to hire reading teachers who work one-on-one as tutors to students who do not meet reading standards in the first and second grades. These Title 1 funded teachers, plus all special education teachers, combine with regular classroom teachers to reduce the size of instructional groups from 24 to about 17 for 90 minutes of daily reading for all students. However, class sizes remain at 24 for the rest of the day.

The Douglass example provides a clear illustration of why simple measures of class size do not provide enough information about the level of individual attention a school is organized to provide, and of how resources must follow instructional goals. Prior to implementing Success for All, Douglass used the dollars for regular classroom teachers and class sizes averaged 17 across the school. As Principal Myra Whitney commented: "We had slowly reduced all class sizes over the years with no plan for how anything in the classroom would change. It wasn't working. Our students were still at the bottom in reading." To implement Success for All, Douglass raised class sizes for all other subjects to reduce group sizes for reading and to provide targeted one-to-one tutoring assistance so students would be reading by third grade. In addition to raising class sizes for other subjects, Douglass redirected resources to the early grades from grades 3 through 6. The decision to reallocate resources away from some students and teachers to focus on others can produce tension. Douglass's use of a proven model with clearly stated staffing requirements minimized this friction. As one teacher said, "Everything is specified by Success for All; we didn't consider quarreling with it because research shows this works."

Douglass also used Success for All as a catalyst for including special education teachers and students in the regular classroom. By the third year of the program, special education students and teachers from previously self-contained classrooms and resource rooms spent most of their time in heterogeneous groups. During the daily 90 minutes of Success for All reading time, special needs students worked in heterogeneous groups based on their reading skill levels. Assigning special education teachers to reading groups which included students from all programs further reduced the size of reading groups for all students. Special education teachers team-taught with

Table 5
Douglass Elementary

Resource Allocation Principles	Model Components	Changes in Teacher Allocation and Use of Time
Reduction of specialized programs	• All Title 1 resources devoted to reading instruction for all students using Success for All model • All special education resource room students integrated into heterogeneous classes	• Special education resource room teachers team teach heterogeneous groups
More flexible student grouping by school professionals	• All students in groups of 18 to 23 for reading and language arts 90 minutes per day • All first grade students reading below grade level receive 1 to 1 tutoring for 20 minutes per day	• Regular class sizes raised from 16 to 24 to free Success for All facilitator and School Wide Title 1 teacher for tutoring • Title 1 resources focused on early grades
Structures to support relationships		
More common planning time for teachers	• Common planning time by grade level three times weekly • Monthly half day meeting between special ed and regular ed teams	• Specialists scheduled to allow common planning time for each grade • Substitutes regularly scheduled to cover planning
Creative definition of staffing roles and work day		

regular education teachers for most of the rest of the day. Cooperative learning plays a large role in Success for All classrooms and makes the integration of special education students easier. Special education teachers spend approximately one-quarter of their time either performing individual assessments or working with regular education and special education students who need targeted help outside the regular classroom.

While Quebec Heights redesigned traditional age-grading practices and Douglass rethought its use of Title 1 resources, the Mary Lyons School (Table 6) used the reallocation of special education dollars as a redesign lever. By including special education students, each previously educated in a private setting at a cost of over $30,000 per year, with regular education students, Lyons created a unique, individualized environment for students and teachers. Mary Lyons is open to all students from 7:15 a.m. to 5:00 p.m. Each classroom from kindergarten to grade 5 has no more than 15 students, and was staffed by a teacher, a teacher intern, and an afterschool teacher. Academic teachers had close to two hours common planning time each day.

The Lyons School paired six classroom teachers with six teaching interns, each pair to work with 10 regular education students and five emotionally disturbed students. Three classroom teachers had regular education certification and the other three had special education certification. This unusual integration of special education students and teachers was not financially driven, but guided by a belief that schools must meet children's needs at their level of development, both academically and emotionally. The Lyons staff aims to give students confidence in their ability to solve problems and learn solutions, whether they be academic or social. The teaching staff are hired to have the attitudes, skills and expertise to meet a broad range of academic, social and behavioral needs. They work closely as a team to analyze the effectiveness of their instructional efforts on an ongoing basis.

In addition to the total integration of special education students, virtually all teaching resources at Lyons supported this design, including Title 1 funds and funds traditional schools would use for subject specialists. A typical Boston elementary school has four subject specialists (usually art, music, physical education and computer education) who supplement instruction and cover planning time for classroom teachers. Having only 90 students, Lyons could not support these specialists. Instead, Lyons pooled these dollars to pay for art and music on a contract basis and for part of the afterschool program.

In summary, each of the three elementary schools pooled its resources from special programs to support its core design. The sample schools used these funds in two distinctly different ways. The Quebec Heights and Douglass schools increased regular education class sizes and redirected funds in order to reduce reading group sizes. Lyons used funds freed from eliminating separate programs to lower teacher student ratios dramatically, moving from a traditional Boston class size of 19 students to one teacher and one highly trained teaching intern for 13 students. In both approaches, staff organization depended on the educational strategies the schools had adopted. The organization of resources and educational goals in these schools were

BEST COPY AVAILABLE

Table 6
Mary Lyons Model Elementary School

Resource Allocation Principles	Model Components	Changes in Teacher Allocation and Use of Time
Reduction of specialized programs	• All students and teachers in heterogeneous classrooms of 15 with one teacher and one teaching assistant	• No separate Title 1 programs • No separate special education groups • Pooling of subject specialist resources
More flexible student grouping by school professionals	• School team determines classroom assignment	
Structures to support relationships	• Support Services team composed of all professionals working with each group of students meets weekly to review individual student progress	• Teams volunteer one hour to meet each week
More common planning time for teachers	• Common planning time 1 ½ hours per day plus common lunch for all teachers • 45 minutes per week of student support team meetings for each classroom	• Afterschool staff provided by outside contractor work from 12:00 to 5:30 to cover planning time for academic teachers as well as afterschool program
Creative definition of staffing roles and work day	• Extended hours from 7:15 to 5:00 p.m. daily • Use of outside contractors • Use of teaching interns as instructional aides	• Paraprofessionals work staggered shifts to cover before school program; half work 7:00 to 1 p.m., half for school hours • Substitute teaching interns paid $10,000 stipend for traditional paraprofessionals earning $18,000 • Afterschool program provided by outside contractor

inextricably intertwined; the organization enabled the schools to implement new teaching strategies and curriculum.

More Flexible Student Grouping

Perhaps the most striking difference between the sample elementary schools and traditional schools is the strategic, proactive way teachers adapted instructional grouping to student needs. In traditional schools, administrators assign students to year-long programs and classrooms; these groupings remain constant across the day and subject. Teachers in the sample schools used their knowledge of student needs, rather than a student's program classification or age, to assign each student to a regular homeroom classroom and to manage their instruction throughout the day. In addition, the Douglass and Quebec Heights schools created significantly smaller instructional groups for reading.

Traditional schools must accept variations in class sizes driven purely by swings in enrollment. Boston's school choice plan enabled Lyons to cap the number of students by grade through the student assignment process. Teachers could control group sizes more closely because Douglass and Quebec Heights draw from a pool of students from two or three grades. For example, the number of students in each age group at Douglass varied from 45 in grade 6 to 73 in grade 1. If Douglass had used age-based grading, class sizes in the first and second grade would have been 24 and 26 respectively, with class sizes declining as students moved toward sixth grade. Instead, the Douglass staff combined grades to create smaller groups of 23 in the first three grades and groups of 26 in the intermediate grades. In this way, sample schools exerted more control in creating class size groupings by combining age and program so that 100 percent of students were in targeted class sizes rather than the 60 to 65 percent who would have been in targeted sizes under traditional age grouping.

In the sample schools, regular education reading groups were significantly smaller than in traditional schools. Quebec Heights and Lyons organized staff to allow groups of seven and six, respectively. Quebec Heights created these small instructional groups by systematically rotating Title 1 teachers and instructional assistants through regular classrooms so each classroom had three instructors for 90 minutes of reading time each day. These reading groupings changed as often as daily. The primary classroom teacher at Quebec Heights determined daily the composition of the groups and content of lessons based on consultation with the expert reading teachers and review of students' progress in specific areas. Some lessons grouped students based on needed further skill development, others grouped students heterogeneously to discuss reading content.

Quebec Heights' grouping strategy for reading involved two tradeoffs. First, in order to staff reading groups adequately, instructional assistants from the intermediate level were allocated to primary grade teachers. Second, the reading teachers were no longer responsible for a homeroom class of students as they would be under a more traditional school organization. This concentration of resources on reading meant that homeroom class sizes, on average, had one more student than the traditional model.

Lyons used the classroom teachers and teaching interns to create reading groups of

six students. At Douglass, all students spent 90 minutes per day in reading groups of 15 to 17, a decrease from the average class size of 24 for other subjects, in comparison to average class sizes of 22 at traditional schools. The composition of these reading groups varied each day and over the course of the year depending on the teachers' assessment of student needs. Every six weeks, a team including the teachers, reading specialists, and the Success for All facilitator assigned students to skill-based, cross-grade reading groups based on formal assessments. Group assignments were based on skill level, as opposed to a more static assignment of aptitude, and students moved on once they demonstrated these skills. Students did not move together through groupings; each group included a range of ages. Students who did not master skills by set times received one-on-one tutoring 20 minutes each day from one of the three reading specialists. At Douglass, about 15 percent of first and second grade students received tutoring at any time, but which students received tutoring varied over the year, depending on who needed extra assistance in particular skill areas.

Continuous assessment and regrouping of students required significant time and joint effort. The full time instructional facilitator specified in the Success For All model helped teachers to conduct assessments, analyze and act on them. The facilitator received in-depth training in using Success For All reading assessment tools, and worked with a district Success For All expert. By pulling this facilitator from the classroom, Douglass once again traded general regular education class sizes for strategic use of resources in support of their school design. In this case, the facilitator enabled a more careful matching of instruction to student needs, and more effective use of joint planning time.

Structures to Support More Personal Relationships

The two secondary schools in the sample were moving closer to the more personal organization that already exists in elementary schools—small schools and closer, more sustained relationships between teacher and student. Even so, the Quebec Heights and Lyons elementary schools went further. The Quebec Heights' family structure aimed to strengthen relationships between teachers and students. Teachers worked three years with the same family of 85 students and usually kept the same homeroom class. This meant that some teachers received as few as nine new students each year. As an intermediate teacher stated, "It's hard to overestimate how much time this saves us. We get started quickly in the new school year, students know the rules and boundaries and I know what they can do."

The Lyons School's small size of 80 to 90 students and intense staffing ratios created a highly personalized environment for all students. Still, the staff found the need to create a weekly time to discuss as a team each student's progress. All the professionals working with each group of students—the classroom teacher, the classroom intern, a special education evaluation specialist, the afterschool director, and social worker—met together to identify problems, discuss possible strategies, and share success and frustration.

More Common Planning Time

Constrained by teachers union contracts and the already limited time available for teacher planning at the elementary level, only the Lyons School dramatically increased common planning time for teachers (Table 3). Douglass and Quebec Heights increased their common planning time for teachers by using the conventional method of scheduling specialists to allow common meeting time for small groups of teachers. But, because the same individual covers the subject specialty for the entire school over the course of the day, it is difficult to schedule common planning time for even small groups of teachers. The staff at Quebec Heights chose to increase their average class sizes to create another specialist position, resulting in one extra 45-minute planning period per week, and allowing daily planning time. Quebec Heights also had the advantage of 20 minutes at the end of each school day due the district's shorter elementary school day.

Lyons' academic teachers shared one hour and 45 minutes of common time each day: a 30-minute lunch period followed by one hour and 15 minutes. During this teacher planning time, students had a half hour for lunch and recess and received instruction from their instructional interns and afterschool teachers. In addition, teachers met voluntarily for 45 minutes each week in the student support team meetings described above. In total, the Lyons' school teachers shared 405 minutes of planning time each week, in stark contrast to the one common period per week in a traditional school.

Creative Definition of Staff Roles and Work Day

The Lyons School was able to create so much more planning time because it departed from the traditional use of specialists and redefined teaching roles throughout the day. In a traditional school, only the classroom teacher or subject specialist assumes responsibility for classroom instruction. The Lyons School has two instructors in each classroom: a master teacher and a highly trained and supervised instructional assistant trainee. In contrast to often poorly trained para-professionals, the Lyons trainees were college educated students working on their master's degrees in special education at Wheelock University. Lyons negotiated with the Boston Teachers Union to convert their paraprofessional slots to create the new instructional assistant trainee position. The Wheelock graduate students receive $10,000 annual stipends and participate in intensive coursework over holidays and summer. A Wheelock faculty member comes every two weeks to observe and discuss the trainee's practice with the master teacher. The trainee's $10,000 stipend is significantly less than the $18,000 in salary and benefits for a paraprofessional. The savings allowed the Mary Lyons School to assign an instructional assistant trainee to each teacher. Wherever possible, the new instructional assistants were recruited from existing paraprofessional staff. While the trainee position represented a short-term cut in pay, it led to full certification as a special education teacher.

In addition, Lyons used contracted teachers who worked hours different from the regular academic teachers to cover school wide planning time. The afterschool teachers

overlapped the regular school day by one hour, during which they managed the classroom with the instructional assistant trainee. This overlap provided a chance for afterschool teachers to make the transition from the regular academic day with someone who had been with the students all day. The eight afterschool teachers, who worked under a contract with the Bay Cove, a nonprofit organization specialized in behavior management and brought a wide range of experience working with emotionally disturbed as well as gifted students. Although the principal did not hire these teachers, she worked closely with Bay Cove to specify their qualities and qualifications. The contract was contingent on the hiring of exceptional teachers.

Secondary Schools

The traditional high school, with its departmentalized instruction and fragmented school day, offers more opportunities for rethinking resource allocation than do elementary schools. The high school we used for comparison purposes was a typical comprehensive high school in New York City, serving about 3,300 students, having approximately the same proportion of special needs and Title 1 students as Central Park East Secondary School, and using traditional staffing and scheduling practices.

As Table 7 shows, the two sample high schools looked different from the traditional high school on virtually every dimension measured. Our analysis focused on the use of instructional staff, but it is worth noting that the traditional high school had many more non-instructional staff than the two restructured schools. Not including custodial and food service workers, more than 40 percent of the total staff had non-teaching assignments, including one principal, nine assistant principals, 13 secretaries, 10 school-based services specialists (social workers, psychologists, etc.), 17 security guards, 22 non-teaching school aides (in addition to 14 classroom-based paraprofessionals), and three librarians. In the restructured schools, just over 25 percent of the staff had non-teaching assignments, and most of these taught at least part-time (Darling-Hammond, 1997).

The traditional high school had one instructional staff person for every 14.7 students, and New York City staffing allocations would reduce the student load to 13 for a student population like that of International High School.[2] But, because fewer than two-thirds of these instructional staff members taught full-time, there was one classroom teacher for every 24 students and class sizes averaged about 33. These special education, bilingual education, English-as-a-Second- Language and Title 1 programs were administered separately and had smaller class sizes and unconnected curriculum. By contrast, all students at Central Park East Secondary and International High Schools had class sizes of 18 and 25, respectively, and their teachers had more planning and professional development time.

The typical traditional high school student attended school from 8:05 a.m. to 2:13 p.m., participating in seven different classes with seven different teachers and one lunch period. Each class was 42 minutes long regardless of lesson or activities, the curriculum of each unrelated to any other. Teachers taught five instructional periods a day and had two periods free from

Table 7
High Performing vs. Traditional Secondary School

Resource Allocation Principles	School Measure	Central Park East	International	Traditional
Reduction of specialized programs	Students per instructional staff member	10.2	10.2	14.7/13*
	Students per full-time teacher	13.3	15.8	23.6
	Average size of regular instructional group	18	25	33.4
	% teachers in regular instructional group	89	100	70
More flexible student grouping	% students in target size grouping	100	100	60
	Average size of advisory group	15	12	29 (homeroom)
Structures to support relationships	Student loads per term	36	75	167
	% professional staff serving as instructors/ advisors	100	100	65
Longer and more varied blocks of instructional time	Average length of instructional period	120 minutes	70 minutes	42 minutes
More common planning time	Common planning minutes/ week	450 minutes	350 minutes	0 minutes
	Length of longest planning period	120 minutes	140 minutes	42 minutes

* A traditional high school that had a 100% limited English Proficiency Pupil population like that at International would receive additional staff to reduce its student/teacher ratio for those students to 13:1.

instruction. Each year one-third of the staff had a building assignment (such as cafeteria duty or hall duty) for one of these periods. These assignments were rotated so that, on average, a teacher had one such assignment every three years. Excluding these special duties, teachers routinely saw about 167 students per day. The two sample high schools began with resources roughly similar to the traditional school but ended with dramatically smaller group sizes and teacher loads. Teachers at Central Park East taught 36 students and those at International 75 students within a given term. This was accomplished by reducing specialization, reorganizing student groups and teaching structures, and redefining the school schedule. The different ways the two schools accomplished this reflected their instructional purposes and philosophy.

Reduced Specialization

Central Park East Secondary School reduced specialization in a host of ways to create smaller teacher-student loads and to focus resources on academic subjects. Central Park East follows the principles embraced by the Coalition of Essential Schools, one of which is that "less is more." Instead of aiming for broad coverage of content, Central Park East has organized its curriculum around five "Habits of Mind"—the abilities to weigh evidence, to take varying viewpoints into account, to see connections and relationships, to speculate about possibilities, and to assess value. These shared goals are reinforced in every course through the comprehensive portfolio assessment system. The school concentrates its resources on a common core curriculum in grades 7 through 10, and uses a variety of other resources to expand curriculum options in the upper grades.

At the time of the study, all Central Park East students took academic subjects in heterogeneous groups averaging 18 in size. (Table 8). Students in Divisions I and II (grades 7 through 10) took two two-hour academic courses each day: humanities and math/science. All full-time teachers in these grades, with the exception of two special education resource room teachers, taught one of the two interdisciplinary courses. The resource room teachers helped students with their regular classroom work, thereby reinforcing rather than fragmenting students' learning. In the Senior Institute (grades 11 and 12), the school reduced its need for specialization by arranging advanced course-taking opportunities for students at local colleges. All students took at least two college courses during their last two years of high school, along with undertaking an internship with a local business or community organization.

Electives and language instruction were provided at Central Park East through outside contracts for hours of services performed. There was no tracking, no separate Title 1 program, and no separate bilingual program. There were no guidance counselors; instead, teacher roles included counseling and advising. There were no attendance officers, deans of discipline, assistant principals, supervisors or department heads, or other positions to deflect resources away from teaching in traditional high schools.

International High School organized its resources to follow its mission of educating recent immigrants and its educational philosophy, which includes the following principles:

34 BEST COPY AVAILABLE

Table 8
Central Park East Secondary School

Principles	Model Components	Changes in Teacher Allocation and Use of Time
Reduction of specialized programs	• All students in multi-aged heterogeneous groups of 18	• No ability grouping • All special education student mainstreamed • No separate Title 1 programs • No bilingual/ESL program • One language teacher coordinates language courses taught on contract • Electives contracted out
More flexible grouping	• Two academic courses per day (Math/Science and Humanities) in grades 7-10 • Senior Institute students (grades 11-12) take college courses, internships, and work one-on-one with advisors in addition to regular courses	• Core teachers in grades 7-10 teach one of two interdisciplinary courses • Senior Institute teachers teach fewer courses and spend more hours supporting their advisee's work on portfolios, college courses and internships
Structures to support more personal relationships	• Advisory groups of 12-15 students • Teacher load of 36 students each • Divisions of 75 students comprising 2 "houses" of 36-38 students that are stable for two years	• Administrative and support functions are incorporated into teacher role (guidance, librarian, discipline, curriculum development, supervision) • Teachers stay with same students for two years

Table 8
Central Park East Secondary School
(continued)

Principles	Model Components	Changes in Teacher Allocation and Use of Time
Longer and more varied blocks of instructional time	• Classes are one to two hours long • Regular periods for counseling, advisement, and one-on-one tutoring are built into teachers' and students' schedules	• Teachers teach fewer classes for longer periods of time • Teachers' roles are varied: advisement and tutoring are part of normal role and schedule
More common planning time for teachers	• Weekly 2.5 hour common "curriculum planning time" per week and bi-weekly 1.5 hour house meeting (grades 7-10) • Weekly senior Institute staff meetings (1.5 hours) • Weekly 3.5 hours whole school staff meetings	• Weekly 2 ½ hour community service project for students (grades 7-10) • Senior Institute students do internships and take college courses off-campus • Two hours of whole school planning time created by early dismissal on Friday and 1.5 more hours by volunteering time after school
Creative definition of staffing roles and work day	• Teachers serve advisory and counseling roles • Teachers devote additional time after school hours to collective planning	• Support staff functions incorporated into teaching role • Teachers volunteer planning time

- Language skills are most effectively learned in context and when embedded in a content area.
- The most successful educational programs are those that emphasize rigorous standards coupled with effective support systems.
- Attempts to group students homogeneously preclude the way in which adolescents learn best (that is, from each other).
- Carefully planned use of multiple learning contexts in addition to the classroom (such as learning centers,

36 BEST COPY AVAILABLE

career internship sites, field trips) facilitates language acquisition and content area mastery.

Clear school goals and consensus about strategies enhanced the ability of International High School to design a coherent, carefully configured organization. As Table 9 shows, International High School reorganized its programmatic resources around 12 interdisciplinary themes. Six self-managing instructional teams called "clusters" were each responsible for the total educational experience of about 75 students each trimester. Each team included four to six teachers plus guidance and paraprofessional staff, and developed two thematically-based courses of study (for example, "Motion" and "Visibility") which integrated four subject areas (such as literature, global studies, mathematics, and physics) for a 13-week course of study. Students chose one thematic course of study three times a year. All teachers, regardless of funding source, are part of cross-functional teams responsible for delivering the core curriculum to a heterogeneous group of students. The groups included students of all native languages, all grades, economic levels and ability levels. International High integrated English-as-a-Second-Language techniques in content-area courses while providing students with opportunities to develop their language skills with instructors outside the core curriculum and in learning contexts, such as internships outside the school.

At International and Central Park East, this integration of previously specialized resources and investment of more resources in teaching, rather than nonteaching positions, translated into lower pupil loads and more opportunity for individual student attention than in the traditional high school. As Table 7 details, Central Park East had one full-time teacher for every 13 students, and International had one teacher for every 16 students, compared with one teacher for 24 students at the traditional secondary school. Half of this difference came from the sample schools' shifting of resources to instructional functions. Both sample schools operated with fewer administrators and support staff than the traditional high school. In addition, the sample schools combined most of their programmatic teaching resources in one core academic program in which all students participated, rather than using special program resources for add-on remedial or special education programs. Central Park East used 89 percent of its teaching resources in the core instructional program while International used all its staff in the core program. In the traditional high school, roughly 70 percent of teachers work in regular instruction.

Shifting more resources to regular instruction allowed the two sample schools to create regular class sizes for academic subjects that averaged 18 students at Central Park East and 25 at International, compared to an average regular education group size of 33 at the traditional high school. These smaller class sizes were achieved in part by creating a broader role for professional staff in the restructured schools, rather than using a variety of specialists to perform non-classroom functions. Staff acknowledged this tradeoff in a set of "understandings that underlie professional staff work" at Central Park East which includes the following statement:

Table 9
International High School

Principles	Model Components	Changes in Teacher Allocation and Use of Time
Reduction of specialized programs	• Students in heterogeneous, multi-aged groups of 23 to 25 students who stay together all day	• No age grading • No ability groups • No separate Title 1 program • No separate bilingual program • All teachers work in interdisciplinary teams • Music, art and p.e. provided by adjunct teachers
More flexible student grouping	• All subjects integrated into 12 interdisciplinary courses	• Daily schedule and student grouping determined by teacher teams
Structures to support more personal relationships	• Teacher-student loads of 75 • All students and teacher have weekly small advisory groups • Students and teachers in clusters of 75 for 13 to 26 weeks	• All professional staff assigned advisory groups • Teachers work in self-managed teams of 4 to 6 that include counselors
Longer and more varied blocks of instructional time	• Typical student day consists of four 70 minute courses per day, with two hour community service or internship each week • Students and teachers can choose a.m. or p.m. shift which start one hour apart	• All teachers teach two interdisciplinary courses, 3 periods per day • Teachers choose, a.m. or p.m. shift, some work extra period per day

Table 9
International High School
(continued)

Principles	Model Components	Changes in Teacher Allocation and Use of Time
More common planning time	• Teachers have 3 to 5 hours of common planning time per week	• Weekly 2 hour community service projects and weekly 3 hour clubs period for students during which teachers meet together
Creative definition of staffing roles and work day		• Electives and native language instruction contracted to outside providers • Staggered teacher work hours with two alternative shifts

In return for smaller class sizes (maximum 20) and smaller total student rolls, teachers will work with students for a total of 22 hours a week in classes, advisories or tutorials, conducting seminars, overseeing projects, giving lectures, or advising and coaching individual students (Central Park East Secondary School, 1991).

More Flexible Student Grouping

Reducing the number of programs, courses, and levels made it easier for the sample schools to match the size of instructional groups to student needs. As Table 10 below shows, 64 percent of all classes in the traditional high school had 29 to 34 students, and 21 percent of classes were smaller than 25. Class sizes were higher in regular education academic classes than in non-academic classes.[3] In contrast, Central Park East and International placed all their students in target size groups, creating groups that averaged 18 and 25, respectively.

Additional flexible grouping strategies were found in the Central Park East Senior Institute (grades 11 and 12), where teachers and students focused substantial attention on preparing the graduation portfolio and applying to colleges. Time was allocated so teachers could provide coaching and support for independent study. A typical teacher taught two classes for a total of about 12 hours per week; spent four to five hours a week supervising independent projects; another four to five hours working with 12 advisees on academic and personal concerns; and another three and one-half hours per week providing one-on-one help to students. The schedule included class periods varying in length depending on their purpose. In addition to in-school courses, students took courses at local colleges and

39 BEST COPY AVAILABLE

Table 10
Teacher Knowledge and Skill Areas

Principles	Change to Traditional	Knowledge of Skill Needed
Reduction of specialized programs	• Integration of programs - Special Education - Title 1 - Bilingual • Elimination of age based grouping • Combination of traditional subjects into interdisciplinary program	• New instructional techniques to engage a wide range of learners • Diagnosing the learning needs of more diverse learners, especially special education students • Assessing the progress of wide range of learners • New curriculum material
More flexible grouping	• Elimination of age and program based grouping • No tracking	• Assessment of student progress • Working in teams to assess/assign students
Structures to support more personal relationships	• Creation of advisory groups • Elimination of traditional support roles • Self managing teacher teams	• Child/adolescent development • Functions of old roles such as guidance counselor • Working in teams
Longer and more varied blocks of instructional time	• Longer class periods	• New instructional techniques • New curriculum

completed internships in businesses and community agencies, which freed time for teachers to work and plan together.

Structures to Create Personal Relationships

Each sample school created lower daily teacher loads: Central Park East teachers were responsible for about 36 students per term and International teachers responsible for 72 to 75 students per term. (A description of how these ratios were achieved is included in Appendix A.) These figures compare with an average of 167 students for each regular education teacher at the traditional high school. Both sample schools used advisory groups as a key strategy for maintaining ongoing relationships with students. Each

40 BEST COPY AVAILABLE

professional staff member worked with a group of 12 to 15 students and their families. The use of all professional staff, not just teachers, allowed advisory groups to be smaller than average class sizes. The advisory group providing academic and personal support met for approximately four hours a week at Central Park East; International's house groups met for about two hours each week. Teachers and advisors used the group time in a variety of ways: for individual study; to discuss health, social and ethical issues; and for individual and group advising and counseling. The advisor served as the expert on the student and met with the family and other teachers to facilitate communication regarding the student's needs and progress. Advisors coordinated parent conferences and the preparation of narrative assessments of student work.

Through advisory groups, all professionals in the two restructured schools worked intensively and regularly with a group of students. At the traditional high school, only 65 percent of the professional staff had regularly scheduled contact with a continuing group of students. Guidance counselors and other support personnel worked intensively with some students, but they did so on a reactive, usually sporadic basis which was not designed to create close, long term relationships.

Longer and More Varied Blocks of Instructional Time

In contrast to the traditional high school's seven 42-minute periods each day, both restructured high schools created longer periods and more flexible schedules. At Central Park East, students in grades 7 through 10 had two two-hour blocks of humanities and math/science each day. Because these two teachers worked together as a team, they could vary the split of time between them to accommodate daily lesson plans. In addition, one morning a week students spent two and one-half hours in a community service project while their teachers engaged in curriculum planning. Other course work, such as language instruction, took place in smaller, usually one-hour blocks of time. In the Senior Institute, classes varied from one to two hours on different days of the week; advisement sessions, internships, and independent work time were scheduled for longer blocks of time to allow students to undertake extended research work with adequate coaching.

At International, students typically had four courses, each of which met for 70 minutes four times per week, a two-hour internship, and an hour-long seminar each week. Each cluster of four teachers controlled their shared students' entire time schedule over the 13-week cycle; they could vary class length as needed for the students' work.

More Common Planning Time

Both sample high schools created structures that demanded and allowed more common planning time. Including staff meetings, Central Park East teachers averaged seven and one-half hours per week in scheduled common planning time. To create this time, Central Park East used four strategies: placing students in community service; using teaching fellows to cover teacher planning time; dismissing students early one day per week; and meeting after school. One morning a week, students spent two and one-half hours in community service activities, during which teachers met with others in their disciplinary field to work on curriculum and assessment issues. Teaching

fellows and other professionals provided classroom coverage to create common planning time during the day. Teachers had from one and one-half to three hours each week to meet with fellow house teachers and with individual students. Special coverage was arranged to deal with important schoolwide issues. For example, math/ science and humanities teachers had four days over the 1994-95 school year to create and evaluate their portfolio assessment strategies. Students were dismissed at 1:00 p.m. on Fridays to create time for a two-hour staff meeting. The students' hours were adjusted over the rest of the week to make up for this time. As stated in the Basic Governance Plan of Central Park East, "the full staff agrees to meet during hours when the students are not in attendance to complete necessary business." In addition to the Friday meetings, teachers attended a regularly scheduled Monday meeting from 3:00 to 4:30 p.m.

At International, teachers had two periods (140 minutes) each week to plan with their cluster while students participated in club activities or college courses. A half-day (about three hours) each week was set aside for student club activities, during which teachers planned together and engaged in staff-initiated professional development. In addition, teachers had a daily 70-minute individual planning period, that often coincided with other team members' planning time. These models offer stark contrast to the traditional high school model in which teachers had one or two 42 minute periods free from instruction—one often devoted to nonacademic duties and the other an individual preparation period—instead of time for working and planning with other teachers.

Creative Definition of Staff Roles and Work Day

Central Park East and International made many changes in the typical roles of teachers and organization of the teacher work day. Both sample schools focused teaching resources on core academic subjects by contracting with outside providers for elective and non-academic subjects. Central Park East also shifted resources away from support functions by incorporating counseling and advising into the teaching role, rather than hiring separate guidance counselors.

Barriers to Reallocating Resources

Interviews, observations and document analysis at these five nontraditional schools indicate five sets of barriers to more flexible allocation of teaching resources, especially efforts to transform long-standing, traditional practices. These barriers include: reluctance to make difficult decisions required by change; selection and retention of knowledgeable, committed teachers; policies, regulations and contractual issues; policies, regulations, contracts and student grouping; and standardized testing.

Reluctance to Make Difficult Decisions Required by Change

Three of the schools studied—Lyons, Central Park East, and International—were newly created schools. The designers of these schools hired teachers and other professionals whose skills and dispositions matched the school design. Asking existing schools to overhaul their organization is a very different prospect. Teachers' efforts to rethink the use of Title 1 funds at Quebec

42 BEST COPY AVAILABLE

Heights offers an illustration of the difficulties. Supporting small group sizes in kindergarten through grade 3 reading required taking resources away from the intermediate grades and converting one teaching position to an instructional aide position. As the principal stated, "It's hard to ask teachers to assume leadership roles when it impinges on long friendships...when tough personnel decisions need to be made, I often end up having to make them....Of course, if I make them, I weaken the principle of teacher leadership. I often feel like it's a vicious cycle." Schools attempting to realign existing resources need to recognize the effort as a long-term process of matching needs to current and future staff. Districts may need to help schools provide selected retraining and outplacement if needed.

The process of rethinking staffing is sometimes easier when a particular staffing model is identified at the start. At Douglass, for example, teachers were asked to commit to implementing the Success for All model, and the district provided an opportunity for teachers who did not choose the model to transfer to a new school. Teachers were given another opportunity to transfer after six months of implementing the new model. It was somewhat easier to accomplish the changes because the model specified particular staffing requirements.

Selection and Retention of Knowledgeable, Committed Teachers

Selection and retention of teachers with the qualities and experience to match the school designs is critical to their success. This is particularly difficult in districts operating under financial stress, as in Cincinnati and New York, where budget pressures have led to job uncertainty for many junior teachers. Because seniority governed teacher assignments, senior teachers whose positions were eliminated in one school could be transferred to other schools. At Quebec Heights this meant that outside teachers could bump less senior members of the school staff. A teacher unfamiliar with or uncomfortable with Quebec Heights' strategy could be assigned to the school. This could also happen in New York City, but the two sample schools there had negotiated control over selection and hiring of their own staff, which gave them some protection over who entered although this did not necessarily protect junior staff when cutbacks occurred.

Teachers in schools that are working to restructure their existing staffs described how a few resisters can make moving forward more difficult. Losing committed team members is also damaging. As one Quebec Heights teacher explained, "It takes at least a year just to understand what we are trying to do, and we have built up such working relationships by then, when we lose someone due to budget cuts, it really sets us back."

The selection and recruitment of specialists, instructional assistants, and teachers often became a sticking point for sample schools. Specialists and instructional assistants in these schools required special training and played very specific roles. Some districts have solved this problem by creating alternative personnel tracks for specially designated schools. Cincinnati has done this for Paidea and Montessori schools. In Boston, schools negotiate control over the hiring process on a position-by-position basis. Recent New York contract

negotiations have allowed teams (including teachers, principals and union representatives) from the growing number of schools that have a distinctive purpose and mission to select their new colleagues. With the recent creation of over 100 new small schools joining the substantial number of longer-standing alternative schools in New York, this provision paves the way for widespread use of new staffing models.

Policies, Regulations, and Contractual Issues

The sample schools directly challenged policies, regulations and teacher contracts related to the teacher work day and job responsibilities. Most of the schools changed the contractually-defined teacher work day and contractual rules for such matters as seniority transfers. In breaking down barriers between programs, age groupings and subjects, the schools also confronted staffing formulas, program administration rules, and, sometimes, teacher licensing categories. And, many of these schools redefined teaching and non-teaching positions to create new jobs which did not fit neatly into existing contractually-defined categories.

Collective bargaining agreements in most districts clearly define the teacher work day, outlining the hours teachers are required to work and limiting the number of required afternoon and evening meetings. Most contracts specify the number of minutes teachers must have free for lunch and planning activities. Many contracts, like the Boston Teachers Union contract, also limit the number of consecutive hours that teachers can be involved in instruction, thereby making it more difficult to create connecting blocks of planning time. Schools in which teachers, rather than administrators, develop curriculum and manage their own and students' time demand new working conditions.

Schools operating largely within existing contracts, such as Douglass and Quebec Heights, are severely limited in creating required planning time. On the other hand, Central Park East Secondary School's governing policy explicitly recognizes that staff members may work longer hours, including afterschool meetings.

In broadening the scope of teaching jobs, schools can run into state, district and collective bargaining restrictions. Using teachers across programs, such as special and regular education, can require waivers. For example, Lyons uses three special education teachers and three regular education teachers to teach integrated classrooms of special needs and regular education students. According to the Boston Teachers Union contract and Massachusetts state certification laws, neither group is certified to teach the other students. Lyons negotiated waivers to both sets of restrictions. The principal argued that she knew how to identify individuals with the experience and disposition needed to handle both special education and regular education students. The principal developed a team structure to take advantage of a staff with varied skills and knowledge, and a professional development plan for each individual teacher, as well as a professional development plan for the entire school, so the entire staff would develop a more balanced set of skills.

Schools also run into certification problems in moving to interdisciplinary instruction. Many collective bargaining agreements and

state regulations require teachers to be certified in more than one subject to teach humanities or math/science in high schools. Finding individuals with the subject matter and pedagogical knowledge combining these subjects effectively is critical to successful interdisciplinary instruction. Certification in both fields is one indicator of this ability, but it is not the only means for developing expertise in a second field. Central Park East uses an interdisciplinary approach in grades 7 through 10, and teachers plan in math/science and humanities curriculum teams. The curriculum teams provide the disciplinary expertise necessary for expanding the teachers' capacities so they can handle the breadth required for the core courses.

The sample schools created different job positions and used hiring arrangements different from anything envisioned by the collective bargaining contracts in their districts. For example, Lyons Elementary and Central Park East Secondary created different kinds of instructional assistant positions. Lyons converted the paraprofessional position to a lower-cost instructional trainee position employing graduate students enrolled in a special education master's program and who want to become teachers. This arrangement allowed Lyons to hire more instructors with more professional expertise. Central Park East hired teaching interns—usually graduate students who were preparing to become teachers—who organized community service placements, conducted seminars, tutored students, and assisted in classrooms. This kind of change would represent a very significant departure if implemented on a wide-scale basis: it would allow schools to rethink qualifications and available resources, and to hire lower cost and more highly trained staff who, although short-term, may be more suitable for some kinds of positions.

Three of the sample schools received waivers from collective bargaining agreements to use outside contractors for specific of instruction. Lyons contracted with a private company to provide its afterschool program. Central Park East used hourly instructors to provide language instruction. And International used students from the community college where International is located as adjunct teachers for art, music and physical education.

Policies, Regulations, Contracts and Student Grouping

Teacher contracts, district policies and state regulations often define class size maximums by program, grade level, and sometimes subject. State guidelines specify the size of classroom for students at each level of special education classification. But if parents, teachers and special education professionals agree to an "individual education plan" that develops the student in a larger, more inclusive setting, then schools can depart from these regulations. For example, Lyons departs from state and district regulations regarding class size by grouping special education students (formerly placed in private schools where student-teacher ratios were well below eight) in larger groups of 15, with significant professional support throughout the day. This departure requires schools to work closely with students and parents to create understanding of the new approach and to insure appropriate additional support for the students. It also demands that state and district officials work with schools to allow educationally sound designs.

District student and teacher assignment policies can also frustrate attempts to use teachers differently. Schools in the sample districts that moved students from more restrictive special education settings into the regular classroom sometimes faced a potential loss of teachers because special education staff were allocated based on the number of students requiring separate education. When schools attempted to integrate students in the regular classroom, resources were reduced, and the regular teacher, in whose class the special education student now spent most of his or her time, received no extra resources and no reduced student load. Regular education classrooms may grow more unruly and crowded in these circumstances even while case loads of special education teachers decline. Schools should be able to find ways to shift resources into the classroom without losing special education expertise, but schools need time and assistance to move in this direction. To respond to this problem, Boston adjusted its staffing formula so schools could use resources for special needs students in inclusive settings.

Quebec Heights' experience in moving from age grading provides another example of how collective bargaining rules combine with student assignment formulas to have unintended consequences. The Cincinnati teachers' contract requires teaching positions to be specified as either grade-level or multi-age. The district determines the number of teachers to be assigned to a school in two ways. For a grade-level school, the number of students in each grade is divided by the target class size to produce the number of teachers to be assigned. For a multi-age school, however, the number of students in each age group is divided by the target class size to determine the number of teachers. Quebec Heights lost two teaching positions because it chose to designate itself a multi-age school.

Standardized Testing

District and state standardizing testing programs are not typically considered a resource allocation issue, but testing programs can pose problems for schools that are changing the content and order of instruction, especially if the tests are content-specific and administered at each grade level. For example, Quebec Heights students must take three different standardized tests, two of which annually test content knowledge that students in their multi-age program may not yet have covered. The pressure to perform well on these tests is so great that Quebec Heights has organized pull-out tutoring sessions to coach students in curriculum they have not yet studied. As one teacher said, "Besides the fact that none of these tests match what we are trying to teach our students in any given year, we simply cannot align our curriculum to address three differently conceived tests each year."

The reconfigured curricula in the two sample secondary schools are more performance-oriented and more challenging, but their students must compete on New York State's Regents Competency Tests, most of which require memorization of large quantities of information unlikely to be used again after the exam. Central Park East and International staff reported that drilling students to pass the state tests takes time and energy away from the more productive learning tasks the students engage in as they develop portfolios, projects, and research papers (Darling-Hammond, Ancess, and Falk, 1995). Teachers, too, find the exercise

a waste of valuable time and intellectual resources.

Developing the Knowledge and Capacity for New Teaching Roles

The new principles of resource allocation assigned teachers to play different roles that required new skills and knowledge. Table 10 highlights the skills needed to implement the new principles. Teachers and leaders of the five innovative sample schools stressed the following skill areas most frequently:

- Developing or learning new curriculum material and approaches;
- Developing new instructional techniques to engage a wider range of learners and to take advantage of longer blocks of instructional time;
- Diagnosing the learning needs of a more diverse group of learners (especially special education students);
- Assessing the progress of a wide range of learners on a greater variety of performances;
- Working in teams; and
- Supervising a teaching intern or an aide.

Similar lists of professional development priorities can be found in many reform documents and district strategies. Teachers interviewed for this study emphasized the time and support needed to learn and develop new curriculum. Each of these five schools required teachers to learn and use new curriculum and, in many cases, to design it. For example, at Quebec Heights, the multi-age elementary school, teachers who formerly taught math in sequence to one grade level had to redesign their lessons to teach concepts to a wider ability range over three grades. One teacher described the initial transition as particularly difficult, "At the beginning of the year, I was given ten textbooks for each grade as though I should teach all three grades at once." Quebec Heights' multi-age structure required teachers to learn two more years of curriculum material and to employ different instructional techniques, such as co-operative learning. Quebec Heights restructured the schedule to provide 45 minutes of planning time during school hours each day, but this time has been used for common planning issues such as assigning students to groups and planning daily schedules. Teachers at Quebec Heights had to learn new curriculum material on their own time, largely without assistance.

In contrast, Douglass devoted virtually all their freed planning and teaching resources to helping teachers learn the new curriculum associated with Success for All. A full-time program facilitator helped teachers determine which materials to use, then observed and coached them in their implementation. Most professional development days were allocated to Success for All learning methods and curriculum.

At International and Central Park East, teachers developed new curricula to integrate subjects into thematic, activity-based, interdisciplinary courses. Teachers needed time to create the curriculum and, in some cases, to develop expertise in new areas. The weekly common planning time and collective staff development time allowed teachers to develop, adapt, and continually improve this

interdisciplinary curriculum. But, most curriculum development occurred through a combination of overtime and grant support.

Teachers in these sample schools were developing the skills and knowledge they needed to implement new school designs as they went along. Professional development in these schools looked very different from professional development in traditional schools because creating a new school increased the need for new knowledge and skills, and increased the opportunities for teachers to learn from each other. As they created a collaborative culture of learning for their students, teachers began to build one for themselves. In these high-performing schools, professional learning happened in ways that varied depending on the school's context. These included: learning from each other in team planning, curriculum development and teaching; formal coursework or in-service activities tied to the school's strategy; principal and peer coaching and evaluation; local or national networks of schools attempting similar redesign; and individual professional reading and classroom research.

Although the five sample schools shared some common needs, the professional development requirements depended more on their curriculum and instruction strategy and the expertise of individuals school staff members. Teachers in the sample schools stressed the central importance of learning from each other in team planning and team teaching situations. Teams, however, still needed to draw upon outside expertise in a host of areas. Some schools had the opportunity to select a staff which included a range of skills and experience, then developed strategies for teachers to share their talents in different settings—committees, teams, and professional development offerings. Others schools actively built this "distributed expertise" as they went along, by using both in-house experts and external resources.

The principal at Lyons assembled a team in which each individual contributed expertise necessary to the Lyons' inclusionary model. Every staff member had a strong background in developmental curriculum, but some had added expertise in different areas—working with high achievers, child development, bilingualism, or emotional and behavioral disorders. One teacher who had a strong business background helped the other teachers to develop management skills (such those needed for supervising instructional assistants).

Lyons had the luxury of hiring teachers to create specific kinds of distributed expertise while Quebec Heights developed a plan to build it. The Quebec Heights principal explained, "Each teacher must be a generalist as well as the most qualified in her area of focus." The school created a professional development plan that prioritized areas for internal expertise. By using substitute money and creative scheduling, each year Quebec Heights sent one-quarter of its staff to take courses during school hours in their individual areas of expertise. Building individual expertise complemented schoolwide professional development in other areas (such as co-operative learning, of which all staff needed to become accomplished practitioners).

For the Success For All model, Douglass created a full-time resident expert responsible for learning new techniques and curriculum and sharing them with the staff.

Freed from daily teaching responsibilities, this instructional facilitator acted as the school's catalyst and co-ordinator for building skills. This model eased the quick introduction of new techniques and curriculum, upon which the Success For All model relies, but did not preclude developing other pockets of expertise across the school. For example, a special grant supported some Douglass teachers in creating an interdisciplinary international summer school program. Participating staff shared this information with the entire school throughout the year in various forums, faculty meetings and demonstrations, and worked with other staff during the academic year to develop small interdisciplinary units.

Central Park East and International used all of these strategies. Staff were hired to ensure distributed expertise on teams, and staff-led professional development encouraged individual faculty to take leadership in coaching one another in areas ranging from curriculum and assessment development to pedagogy and strategies for meeting the needs of diverse learners.

Conclusion

These five high-performing schools look very different from one another, but they have all begun rethinking how they allocate teaching resources so they can meet student needs and create the time teachers need to implement a new vision of schooling. The sample schools demonstrated that schools considering new designs must also reexamine their use of resources. The framework presented in this paper provides researchers and practitioners with a way of systematically examining possibilities of reallocating teacher resources and of measuring their impact. Changing school organizations to fit an instructional vision requires schools to confront long traditions and a host of state, district and union policies and practices that conflict with many of the changes described here. These barriers can loom large, but the biggest constraint may be a limited vision of the changes in school organization that can create a more professional organization and improve student achievement.

This paper aims to provide clear, detailed examples that schools might use to develop such a vision. A comprehensive vision would include goals for student achievement, educational strategies and an organization to accomplish these goals. The models presented here suggest that resource reallocation and the design of an instructional vision and strategy are inextricably intertwined. Restructuring resources makes no sense without an underlying educational design. For example, the actions of integrating all special education students as Lyons did, or increasing regular education class sizes as Douglass did, have no inherent merit without an accompanying educational strategy. At the same time, none of these models could have accomplished its goals without changing its use of resources. As these and other models accumulate evidence of improved student performance, states and districts might work with schools to adopt proven designs in a conscious process of changing resource allocations and regulations. As part of the design selection, schools might undertake a comprehensive review of how their practices, resources, knowledge and skills must change to implement the new model. The principles of effective resource allocation and indicators of their use presented in this paper could

serve as tools to help schools and districts understand their progress. Districts and states could support the schools' comprehensive plans and develop strategies for helping schools confront the obstacles (including state and district policies) they will face in making such basic changes.

The five high-performing schools studied here only touched the potential for rethinking school resources. The schools worked largely within existing salary structures and have not particularly explored the use of technology in the classroom. Nevertheless, they foreshadow the ways schools must rethink existing resources in order to create more personalized education for students and more professional responsibility and growth for teachers.

References

Carroll, J.M. (1994). Time for the Copernican plan. *Phi Delta Kappan, 76*: 104-114.

Central Park East Secondary School (1991, August). *Understandings that underlie professional staff work at CPESS.* Unpublished Manuscript.

Central Park East Secondary School (1990, May 7). *Basic governance plan.* Unpublished manuscript.

Darling-Hammond, L. (1997). *The right to learn: A blueprint for creating schools that work.* San Francisco: Jossey Bass.

Darling-Hammond, L. (1996). Restructuring schools for high performance. In Susan Fuhrman and Jennifer O'Day (eds). *Rewards and reform: Creating educational incentives that work.* San Francisco: Jossey Bass.

Darling-Hammond, L., Ancess, J., and Falk, B.0 (1995). *Authentic assessment in action: Studies of schools and students at work.* NY: Teachers College Press.

International High School (IHS) (1995). *International high school 1993-94 end of year evaluation report.* NY: Author.

Lee, V. E., Bryk, A., and Smith, J. B. (1993). The organization of effective secondary schools. In Linda Darling Hammond (ed.), *Review of Research in Education, 1993.* Washington, D.C.: American Education Research Association.

Miles, K. H. (1995) Freeing resources for improving schools: A case study of teacher allocation in Boston public schools, *Educational Evaluation and Policy Analysis, 17*: 476-493

Miles, K. H. (1997a). *Spending More at the Edges: Understanding the Growth in Public School Spending from 1967 to 1991.* UMI press.

Miles, K. H. (1997b). Finding the dollars to pay for 21st century schools: Taking advantage of the times, *School Business Affairs,* June.

National Center for Education Statistics. (1994). *The digest of education statistics.* Washington, DC: Government Printing Office.

National Commission on Teaching and America's Future (1996). *What matters most: Teaching for America's future.* NY: Author.

New York City Board of Education (1993). *High schools allocation information, guidelines and instructions, 1994-95.* NY: Author.

New York City Board of Education. (1993). *Comparative analysis of the organization of high schools, 1992-93.* NY: Author.

Organization for Economic Cooperation and Development. (1995). *Education indicators.* Paris: Author.

BEST COPY AVAILABLE

Rettig, M.D., and Canady, R.L. (1993). Unlocking the lockstep high school schedule. *Phi Delta Kappan, 70,* 310-314.

Rothstein, R., with Miles, K. H. (1995). *Where's the money gone?* Washington, D.C.: Economic Policy Institute.

Sarason, S.B. (1982). *The culture of school and the problem of change*. Boston: Allyn & Bacon.

Tyack, David and Tobin, William (1994). The "grammar" of schooling: why has it been so hard to change? *American Educational Research Journal, 31,* (3): 453-479.

Appendix A

How Restructured High Schools Reduce Student Loads

One of the presumably unchangeable aspects of secondary schooling is the large numbers of students teachers teach each day. This situation is due to specialization of functions and of subject matter teaching; hiring of large numbers of auxiliary personnel to coordinate, monitor, and supplement the work of teachers; and the use of short blocks of teaching time for each subject.

Schools like Central Park East Secondary School and International High School are able to reduce the numbers of students teachers see each day, week, and year by reducing specialization, hiring more staff who teach and fewer staff who perform non-teaching functions, and expanding the length of time teachers and students spend together in the context of each course. (This also means that students take fewer courses: usually three or four courses per term rather than seven or eight.) As a consequence, Central Park East teachers work with about 36 students a term and International teachers work with about 75 students, rather than the 150 or more student load, common to traditional urban high schools.

The arithmetic of these staffing arrangements can be seen in the following chart which begins with a common hypothetical base of 100 students and shows allocations of staff and time for a traditional school and for Central Park East. If the

	Traditional Model	Central Park East Model
Number of students	100	100
Number of staff[1]	11	12
Number of classroom teachers[2]	6.5	10.2
Number of students per teacher	15.3	10.2
Number of different sections per teacher	5 sections of 42 minutes each	2 sections of 120 minutes each
Number of minutes of teaching daily	210 minutes	240 minutes
Percent of school day taught by a single teacher	56 percent	64 percent

[1] Because the Central Park East model requires fewer administrative staff, who are more expensive than teaching staff, it enables the hiring of somewhat more staff in total.

[2] In the traditional model only about 58 percent of staff have full-time teaching responsibilities and only 63 percent have any teaching responsibilities. In the Central Park East model, almost all staff have teaching responsibilities.

traditional high school teacher taught in a self-contained setting like and elementary teacher, he or she would work with 15.3 students daily.

However, because the secondary teacher teaches only 56 percent of the day, and because students have to be covered under the traditional model for 100 percent of the day, average class size nearly doubles to about 29 students. Because each teacher teaches only one subject and students go to other teachers for other subjects, the teacher's daily student load for a traditional five-period class load is 29 x 5 = 145. In a traditional school, many regular education teachers carry heavier student loads because of smaller than average classes for special programs and because many teachers have part-time administrative duties that remove them from the teaching pool.

Central Park East has more classroom teachers because it hires fewer non-teaching staff, and almost all staff are teachers. With a base of 10.2 teachers for each 100 students, a teacher would carry a student load of 10 pupils if he or she taught them all day long. Although teachers cover only 64 percent of the Central Park East school day, the rest of the students' time is partially managed in ways that do not require hiring additional teachers. In addition to lunch, students are involved in internships, community service assignments, independent research, and at the Senior Institute level, off-campus college courses. The increase in average class size necessary to cover teachers' non-teaching time is smaller, resulting in an average class size of about 15. The average class size of 15 is raised to about 17 or 18 because courses do not meet for a full 120 minutes per day: on some days the courses meet for only 90 minutes to increase teachers' planning time. An average class size of 17 to 18 means that Central Park East teachers teach 34 to 36 students daily, teaching only two long classes to separate groups of students, rather than the five short classes teachers have in the traditional high school.

End Notes

1. A similar analysis quantifies the impact of these practices in three other districts: Fall River, Massachusetts, Middletown, New York, and East Baton Rouge, Louisiana (Miles 1997a).

2. Because International High has a unique student population comprised of 90 percent Chapter 1 eligible and 100 percent limited English proficient students, an analogous traditional school could not be found for comparison. Instead, we used the New York City staffing guidelines, as outlined in the New York City publication *Comparative Analysis of the Organization of High Schools, 1992-93*, to estimate staffing for students identified for special needs programs.

3. New York City Schools, *Comparative Analysis of the Organization of High Schools, 1992-93,* pp. 82-92.

Nondiscrimination Statement

The University of Pennsylvania values diversity and seeks talented students, faculty and staff from diverse backgrounds. The University of Pennsylvania does not discriminate on the basis of race, sex, sexual orientation, religion, color, national or ethnic origin, age, disability, or status as a Vietnam Era Veteran or disabled veteran in the administration of educational policies, programs or activities; admissions policies, scholarships or loan awards; athletic, or University administered programs or employment. Questions or complaints regarding this policy should be directed to Executive Director, Office of Affirmative Action, 1133 Blockley Hall, Philadelphia, PA 19104-6021 or (215) 898-6993 (Voice) or (215) 898-7803 (TDD).